SC-21

21st Century Surface Combatants

-

ASNE Logistics Symposium

13 FEB 97

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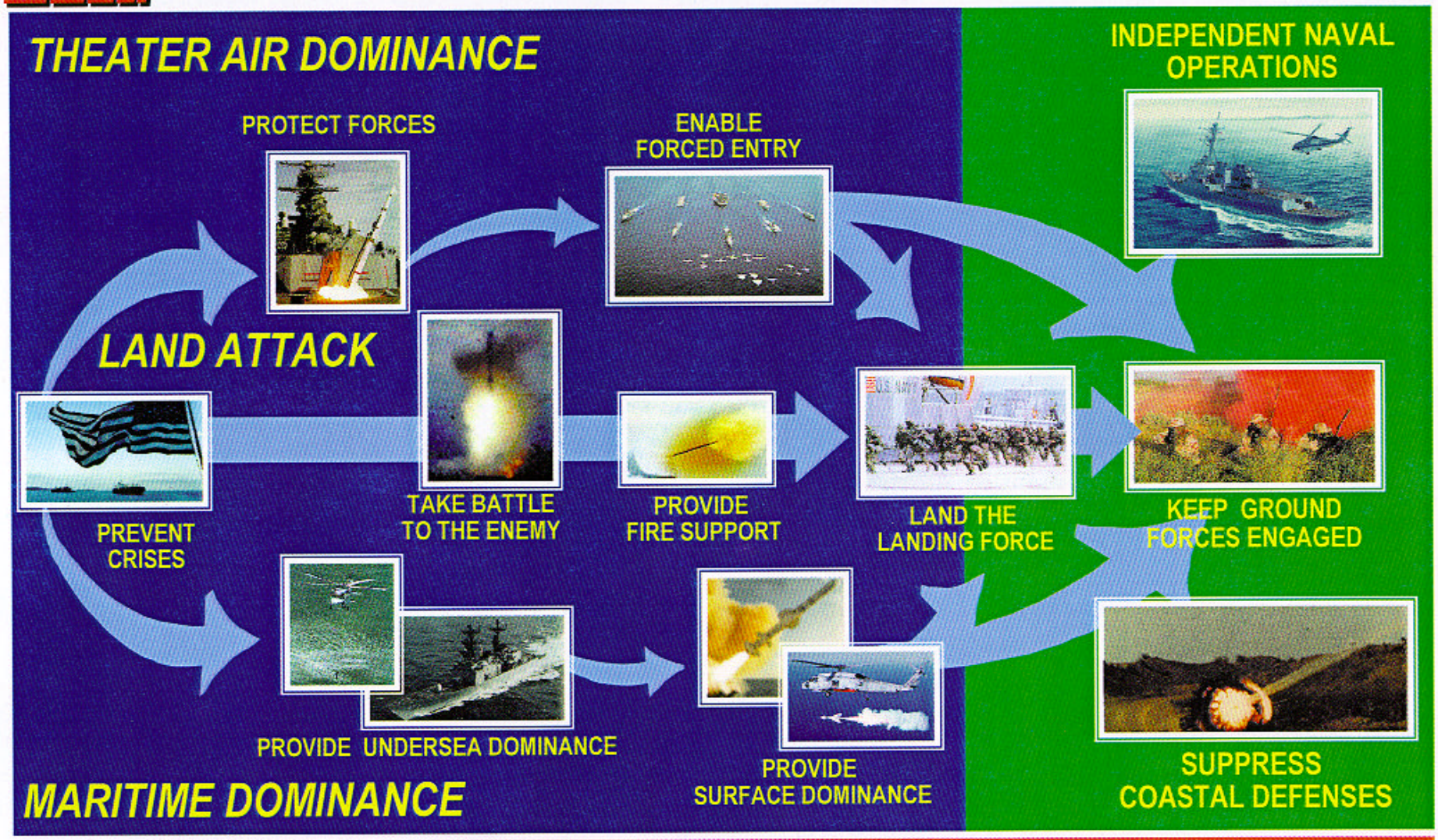
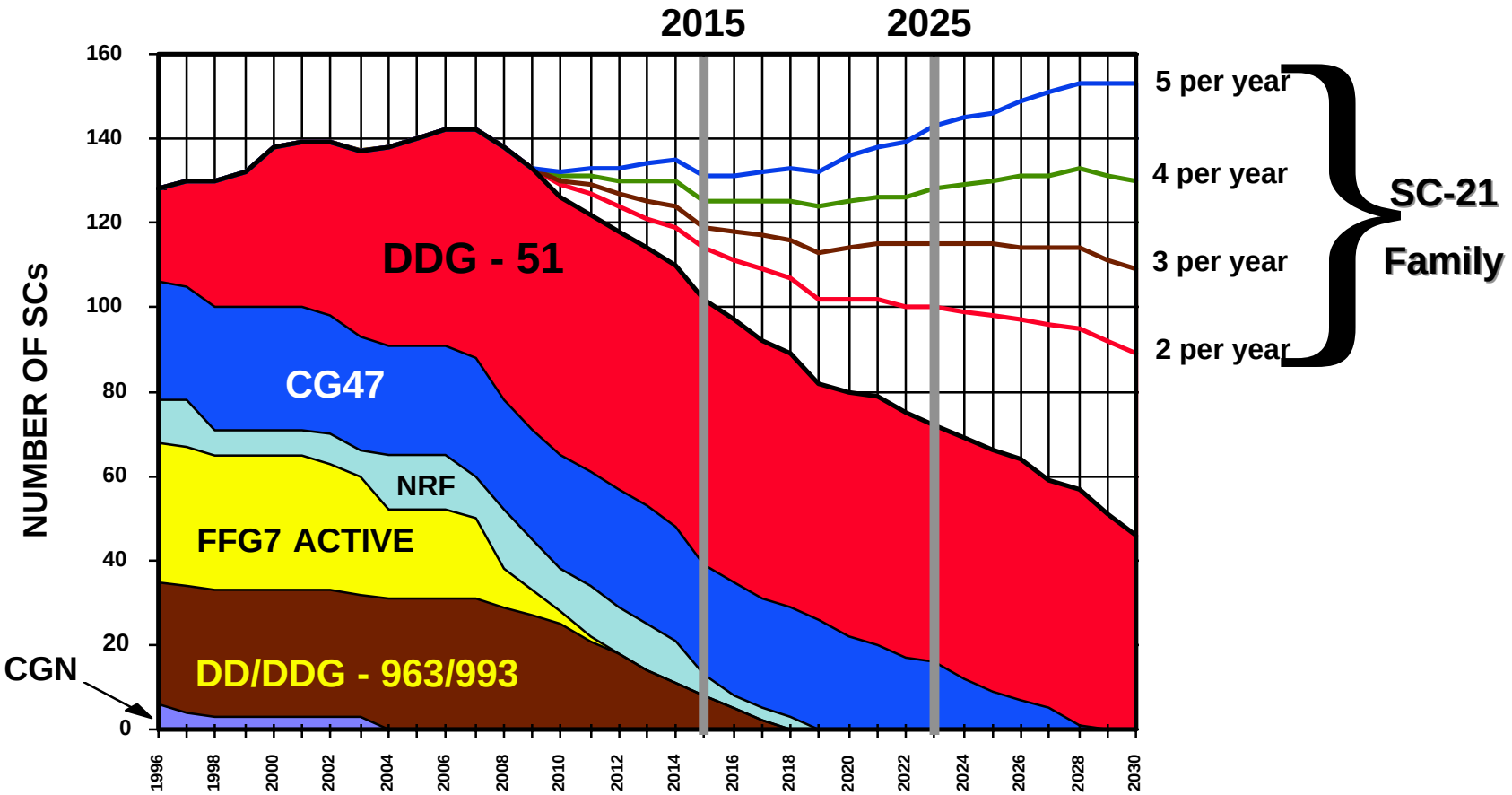
NAVY FOCUS IS ON THE LITTORAL



SURFACE COMBATANT INVENTORY



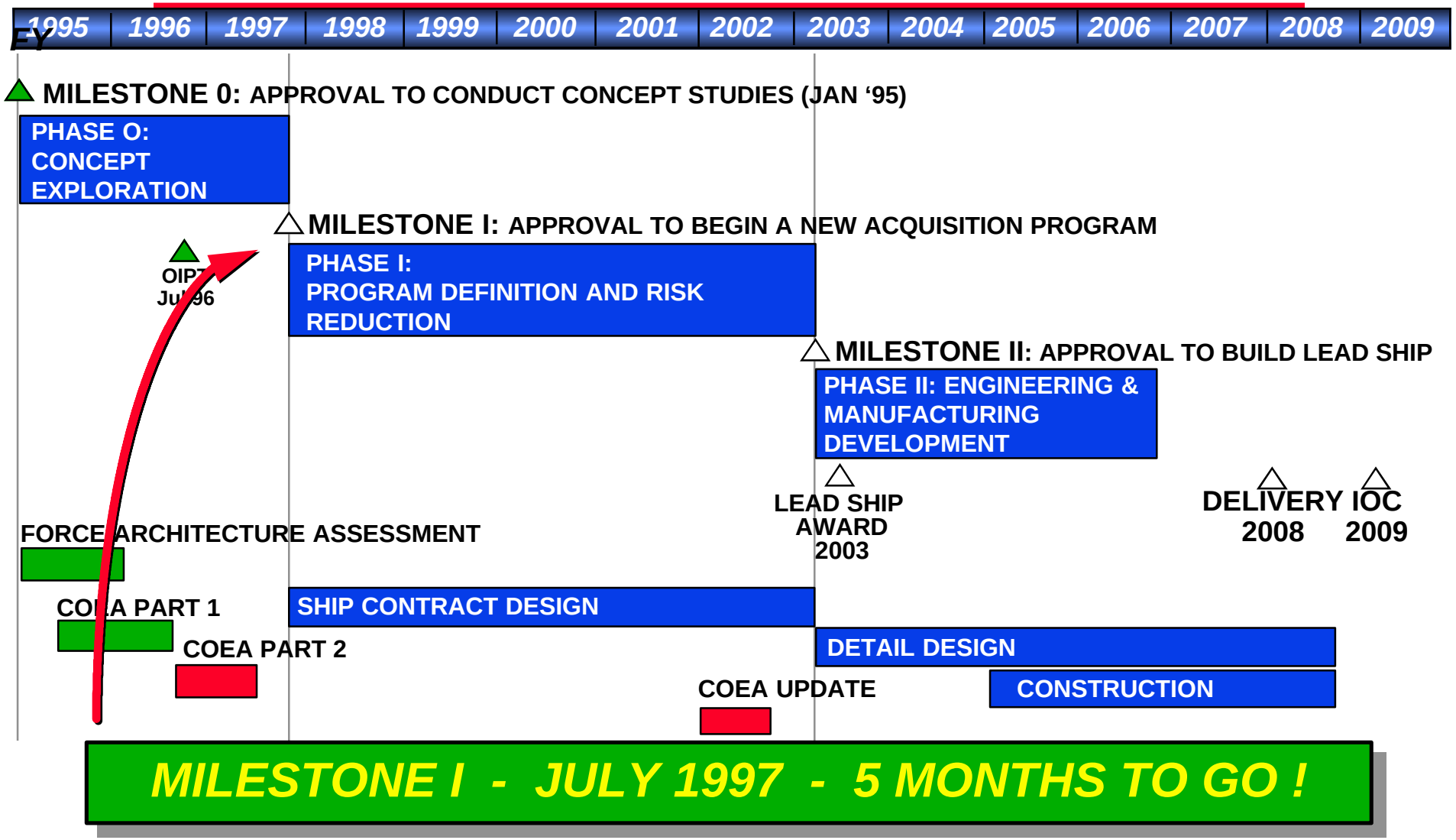
Capability/Affordability/Force Level - Tradeoff

Mission Need Statement

- TOTAL SURFACE COMBATANT FORCE WARFIGHTING CAPABILITY
- IDENTIFIED DEVELOPMENT CONSTRAINTS
  - ARCHITECTURE
    - » OPEN
    - » MODULAR
  - DESIGN
    - » COMMONALITY (MODULAR)
    - » AUTOMATION
    - » EASILY UPGRADED - MAINTAIN TECH PACE
  - PERSONNEL
    - » SIGNIFICANT MANPOWER REDUCTION

COMMON TO ALL SC 21 CONCEPTs

SC-21 SCHEDULE

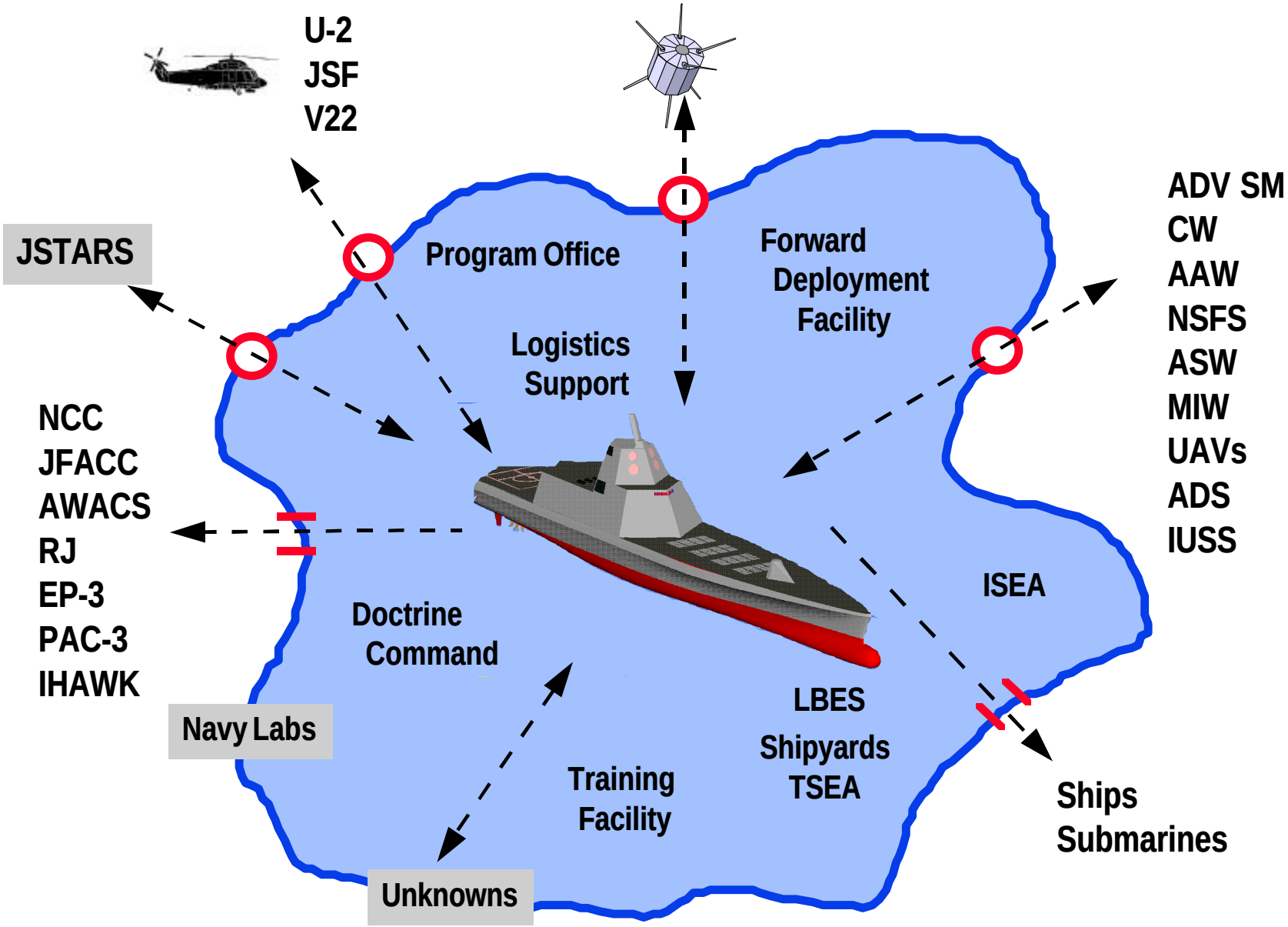


N86 GOALS

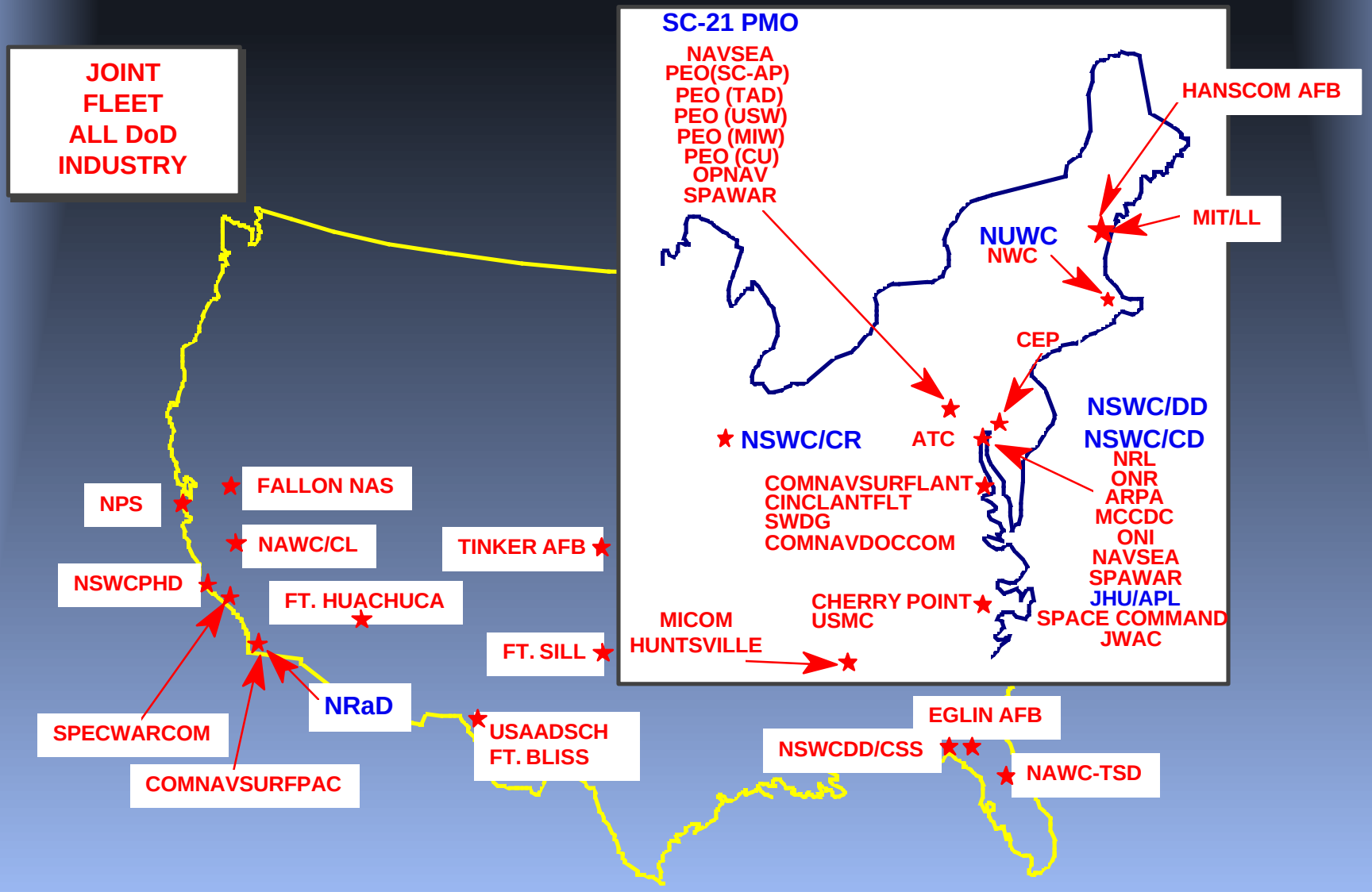
- **Signature Requirements**
  - **Balanced RCS, IR, Magnetic, Acoustic against threat**
- **Manning**
  - **30 % of DDG-51 Class**
- **Affordability**
  - **30 % O&S Costs of DDG-51 Class**

SIGNIFICANT IMPACT ON SYSTEMS ENGINEERING -- RISK REDUCTION & LOGISTICS APPROACH

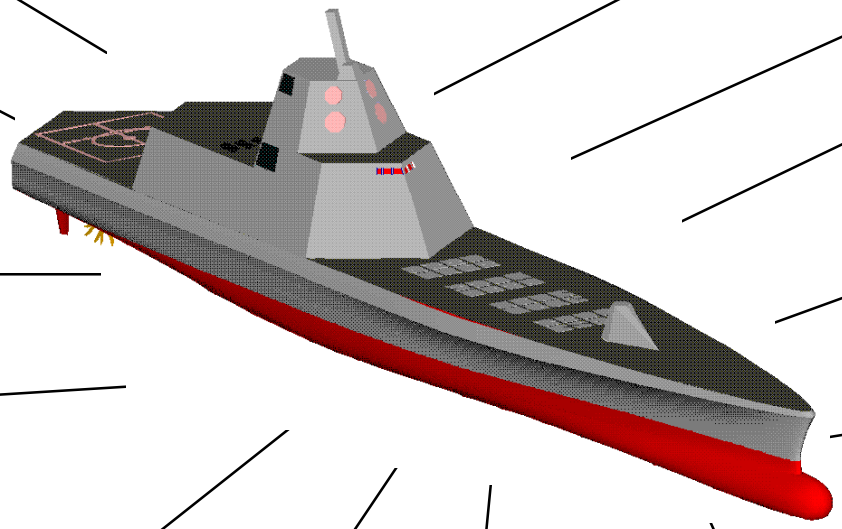
THE SC-21 "SYSTEM"



SC21 TEAM


JOINT
FLEET
ALL DoD
INDUSTRY
SC-21 PMO
NAVSEA
PEO(SC-AP)
PEO (TAD)
PEO (USW)
PEO (MIW)
PEO (CU)
OPNAV
SPAWAR
HANSCOM AFB
MIT/LL
NUWC
NWC
CEP
NSWC/DD
NSWC/CD
NRL
ONR
ARPA
MCCDC
ONI
NAVSEA
SPAWAR
JHU/APL
SPACE COMMAND
JWAC
NSWC/CR
ATC
COMNAVSURFLANT
CINCLANTFLT
SWDG
COMNAVDOCCOM
CHERRY POINT
USMC
MICOM
HUNTSVILLE
NPS
FALLON NAS
NAWC/CL
TINKER AFB
NSWCPHD
FT. HUACHUCA
FT. SILL
NRaD
SPECWARCOM
COMNAVSURFPAC
USAADSCH
FT. BLISS
EGLIN AFB
NSWCDD/CSS
NAWC-TSD

JOINT VISION 2010
DoD LOGISTICS STRATEGIC PLAN



- Mobility
- Prepositioning
- Versatile
- Flexible
- Precise
- Easily Deployed Anywhere
- Fusion of Information and Logistics Technology
- Reduce Cycletimes
- Reduce Logistics Response Time
- Total Asset Visibility
- Seamless Logistics Systems
- Modern Logistics Systems
- Best Business Practices
- Reduce Cost of Ownership

DoD / Industry Partnership

SC-21 CHALLENGES

- **Reduce Life Cycle Costs While Achieving Requirements**
- **Define the "Voice of the Customer"**
- **Performance Specification / Contract Development**
  - Requirements - Validation - Metric - Incentives/Penalties
- **Three Year Deployment**
- **Operate New Logistics Paradigm Against Backdrop of Legacy Systems and Infrastructure**

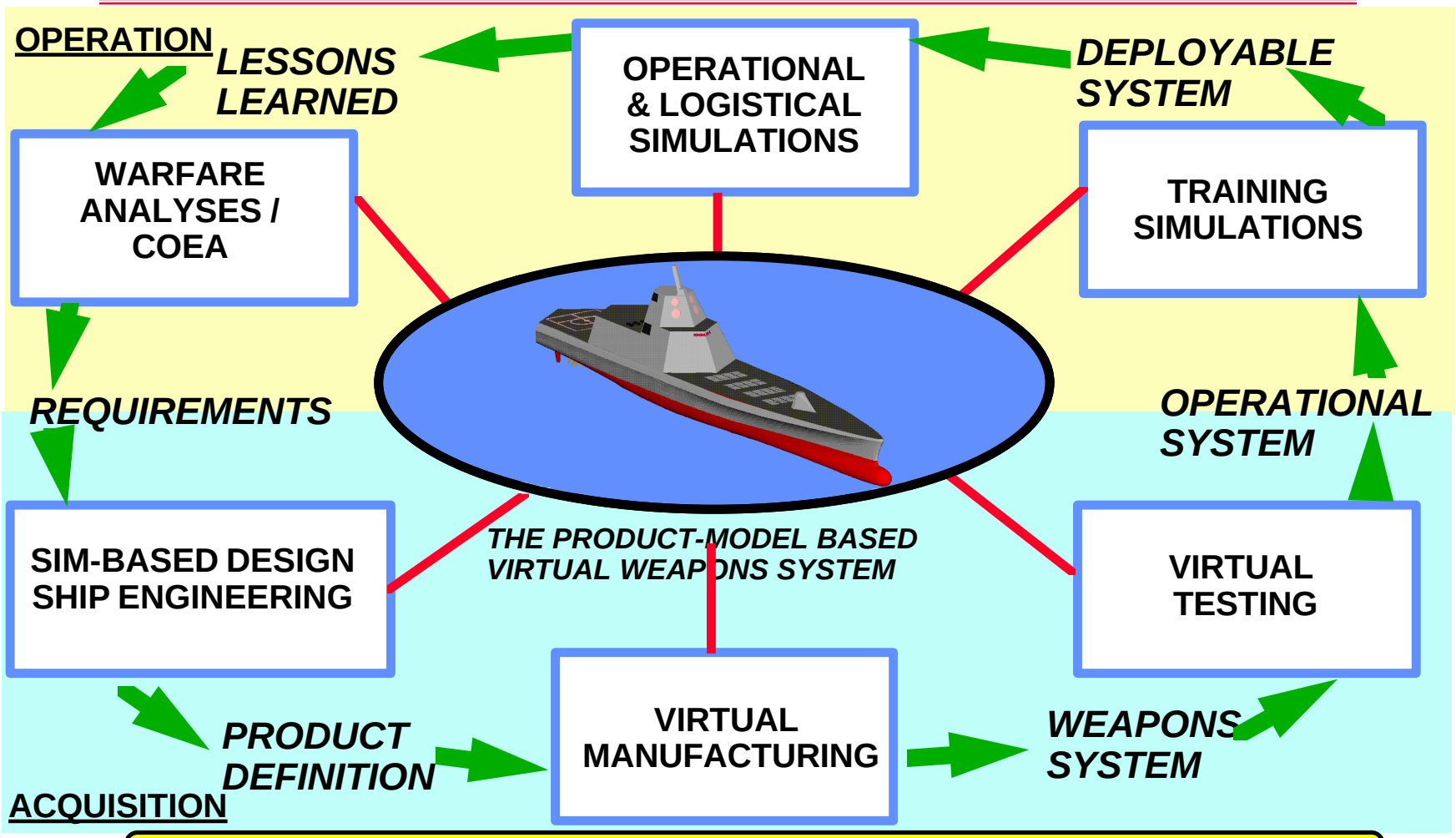
OVERARCHING LOGISTICS PRINCIPLES

- **Design for Affordability**
  - **Logistics / Life Cycle Cost must be considered as part of every decision**
  - **Must Impact the Design**
- **Improve Readiness Through:**
  - **High Reliability**
  - **Innovative Supportability**
  - **Innovative Training**
  - **Human Systems Interface Improvements**
  - **Modular Design**
- **Exploit Information Systems Technology**
- **Industry Partnership**
- **Innovations must be in concert with Navy Corporate Vision**

TOTAL SYSTEM ENGINEERING APPROACH

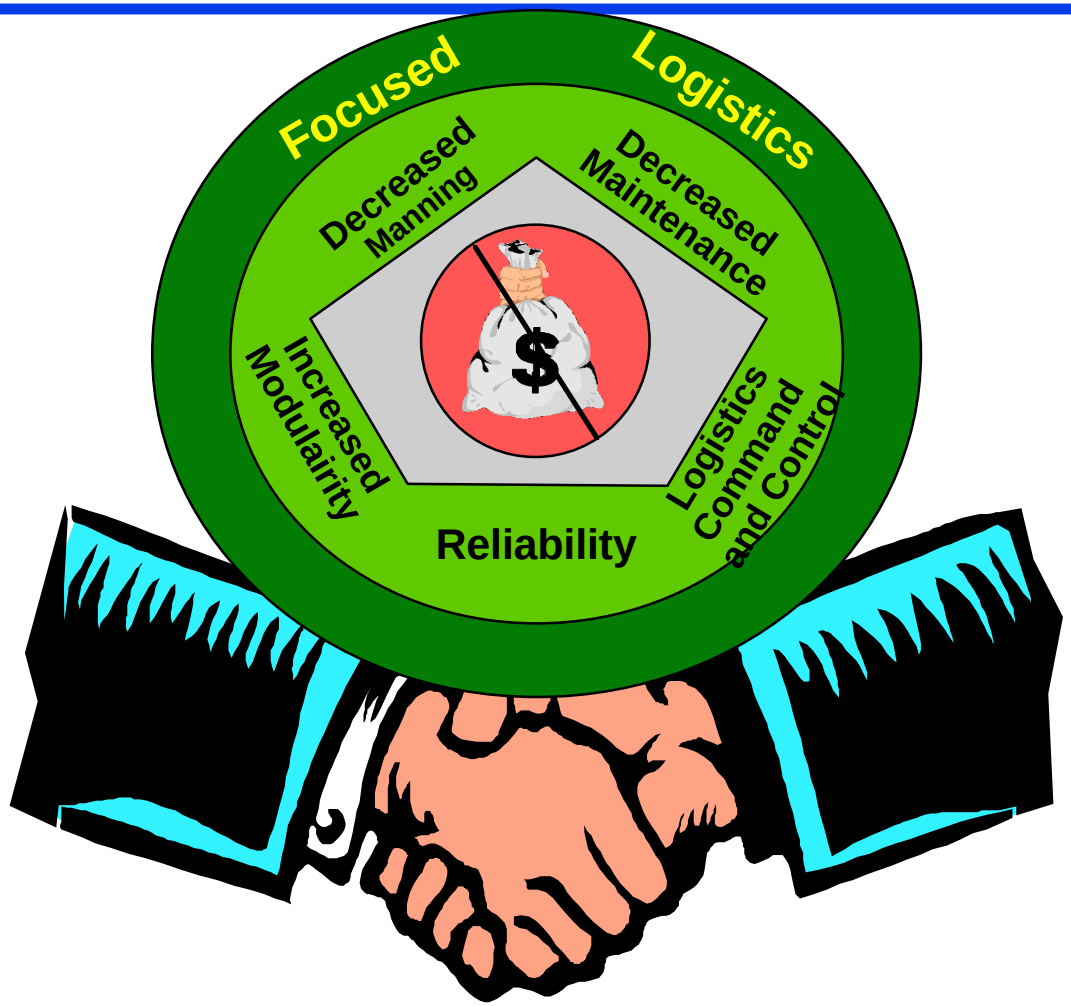
- **Baseline the Current Process**
- **Perform Functional Analysis**
- **Assess Risks**
- **Create New Logistics Model**
  - **Metric for Proposal Evaluation**
- **Re-Baseline**

SIMULATION-BASED DESIGN
THE VIRTUAL SHIP LIFE CYCLE

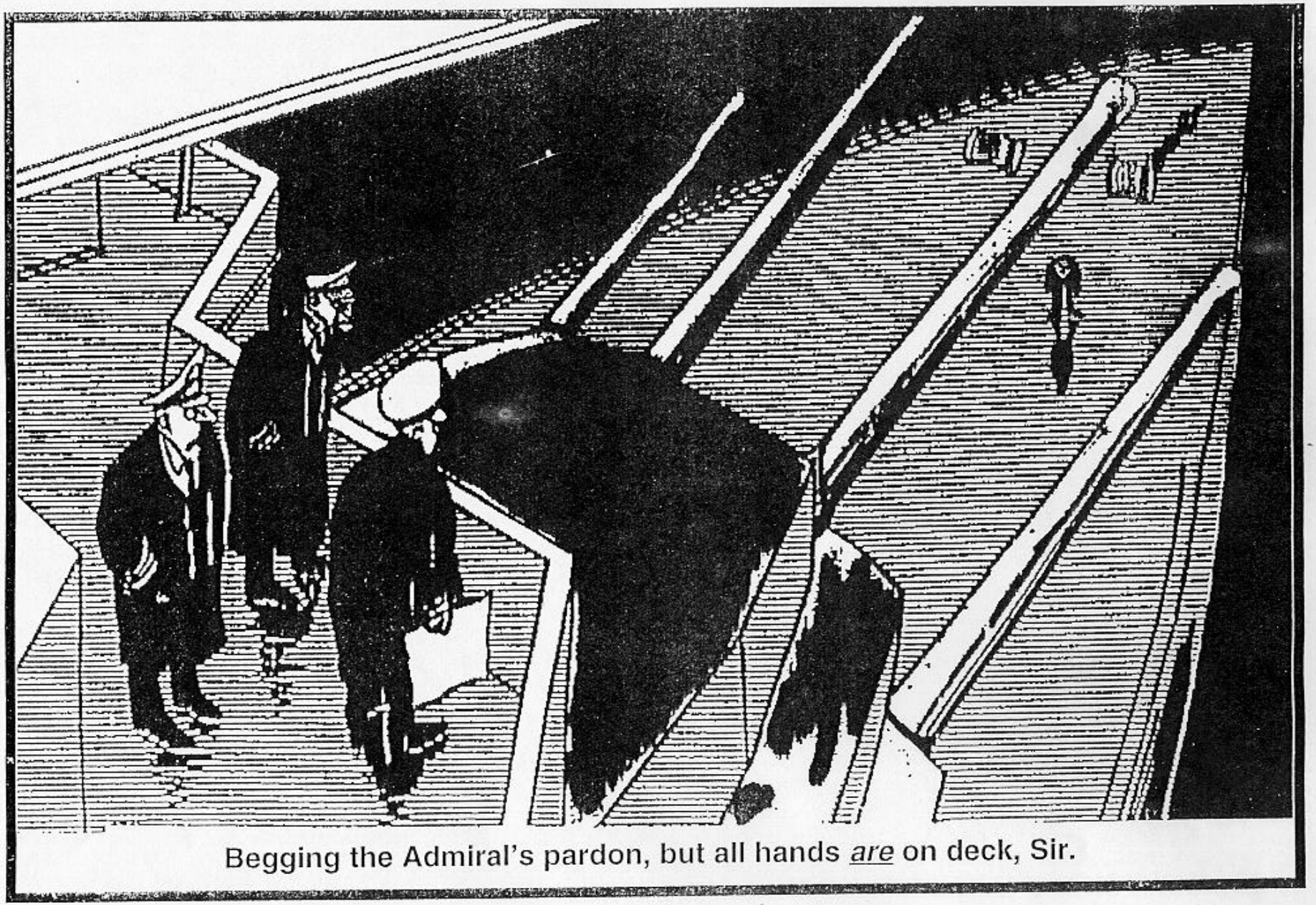


VISION: CONCEIVE, DESIGN, BUILD, TEST, TRAIN, AND OPERATE A WEAPONS SYSTEM IN A COMPUTER

SC-21 LOGISTICS MOSAIC



GOVERNMENT / INDUSTRY PARTNERSHIP


Begging the Admiral's pardon, but all hands *are* on deck, Sir.

SC-21 REDUCED MANNING

DEPENDENCIES AND ASSUMPTIONS

- **Success of Reduced Size Crews depends on:**
- **A Highly Automated Ship**
  - **Ship Control & Navigation**
  - **Command & Control**
  - **Combat Systems**
  - **Engineering & Damage Control**
- **Design for Redundancy, Reliability, and Survivability**
  - **Meet Technical Challenges**
- **Hi-Mix Crew for Flexible Cross-Utilization**
  - **Culture & Tradition Changes**
  - **Just In Time Training**
- **Extensive, Dedicated Off-Ship Support Structure**
  - **Forward Base Maintenance & Fly-Away Teams**
  - **Personnel and Technical Support Ashore**
- **Further Analysis needed to Identify Specific Systems and Equipment Improvements Needed**
  - **Major Concerns - - Full Integration of Combat System Elements**

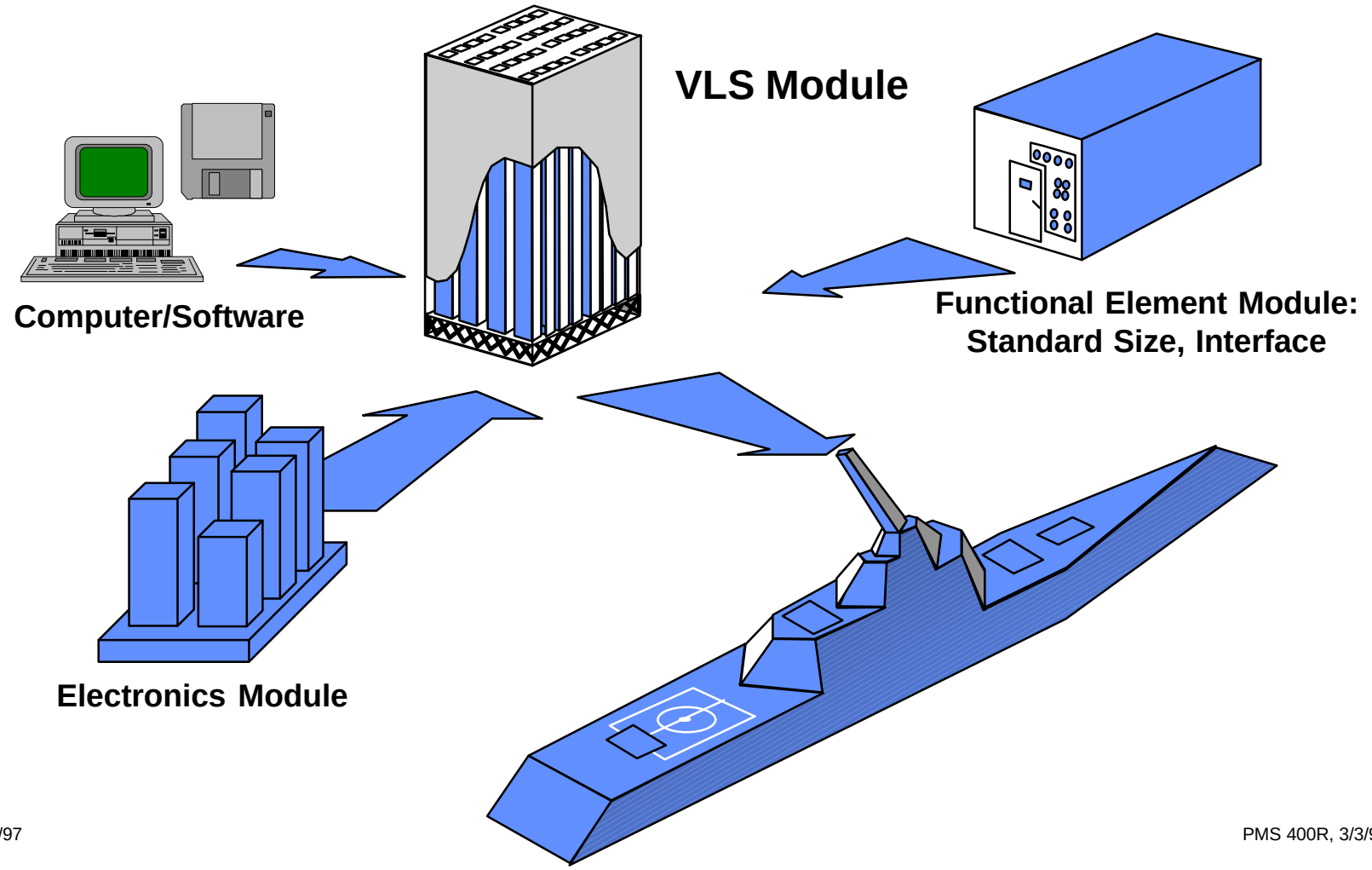
We've Got to Do Better!

SC-21 REDUCED MAINTENANCE

- Improved Reliability and Maintainability
- Modified Two Level Maintenance
  - » Minimal Organizational to Full Depot
  - » Supplemented by Voyage Repairs
  - » Eliminate Time Based Maintenance
- Short Depot Availabilities (< 60 Days)
- Maximum Time Between Drydockings (> 10 Years)
- Exploit Information Systems Technologies
- Single Agent for Management of All Levels of Maintenance
  - – PMS Requirements to Depot
  - – Continuous Evaluation and Planning

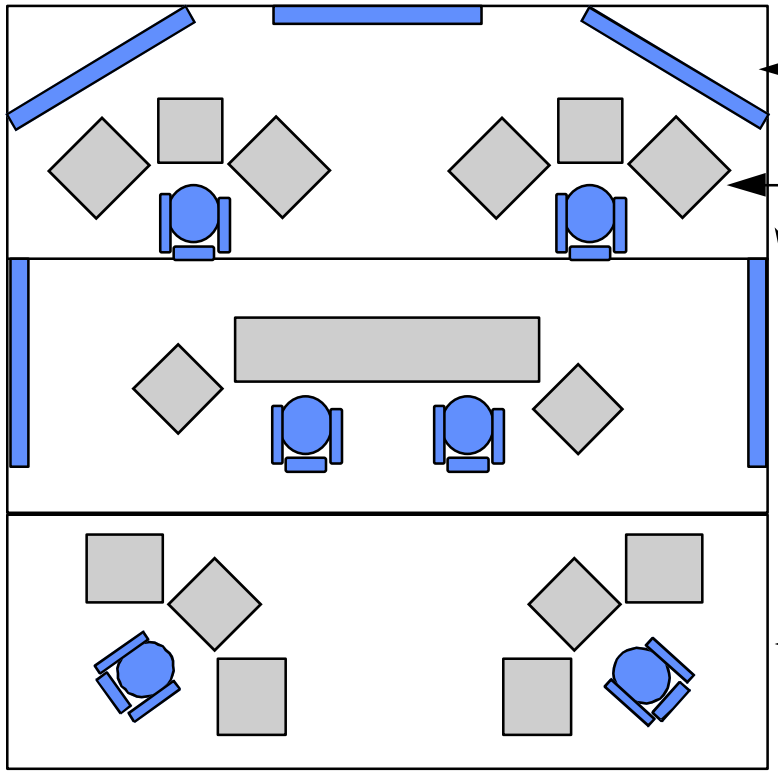
MISSION SUPPORT SYSTEM SELECTION

Variable Architecture to Support Mission Capabilities, Rapid Upgrades



CONSTRUCTION MODULARITY

Systems can be Assembled, Integrated and Tested Off-site, Prior to Installation.



Pre-wired, bulkhead mounted heads-up display screens

Modular Workstations/Equipment Installed using SMART-Deck

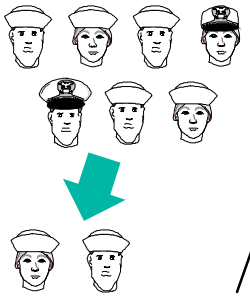
Space made up of 3 Integrated (standard) 8'x20' modules.
All wiring, pipes, ducts, cabling, connectors installed & tested off-site.
Pre-integrated C³I suite - turn key operation.

Modular Ship Command Center

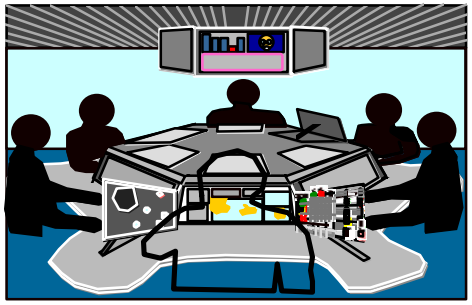
RELIABILITY

If it ain't broke, you don't have to fix it!

Maintenance Savings



Reduced Manning



Training

Quality of Life

"Our ultimate goal is not for more efficient maintenance, it's for no maintenance at all"

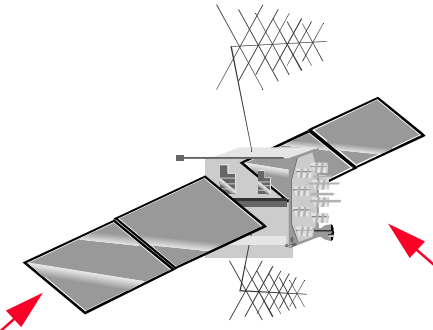
RADM Clark,
CINCLANTFLT
Maintenance Officer

LOGISTICS COMMAND & CONTROL

Maintenance
- Video Maintenance
- Tele-Maintenance
- CBM Prognostics
- Remote Monitoring

Training
- Computer Based Training
- Virtual Environment Training
- Embedded Training

Total Digital Environment
- Paperless Ship
- On-Line Tech Manuals
- Mobile Displays
- Off-Ship Data Access
- Auto-Update of ... Tech Data



Autonomics
- Decision Aides
- Remote Surveillance
- Remote Control & Monitoring

Supply Support
- Automated Procurement
- Total Asset Visibility
- Just In Time

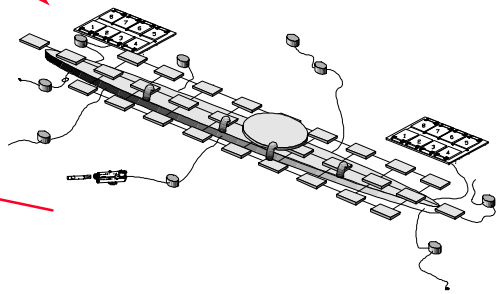
Quality of Life

Medical

Administration

Intra-Ship Information Dominance

Continuous Connectivity
- Ship to Ship
- Ship to Shore



FOCUSED LOGISTICS

... emphasizes the "Fusion of Information and Logistics Technologies"
Joint Vision 2010

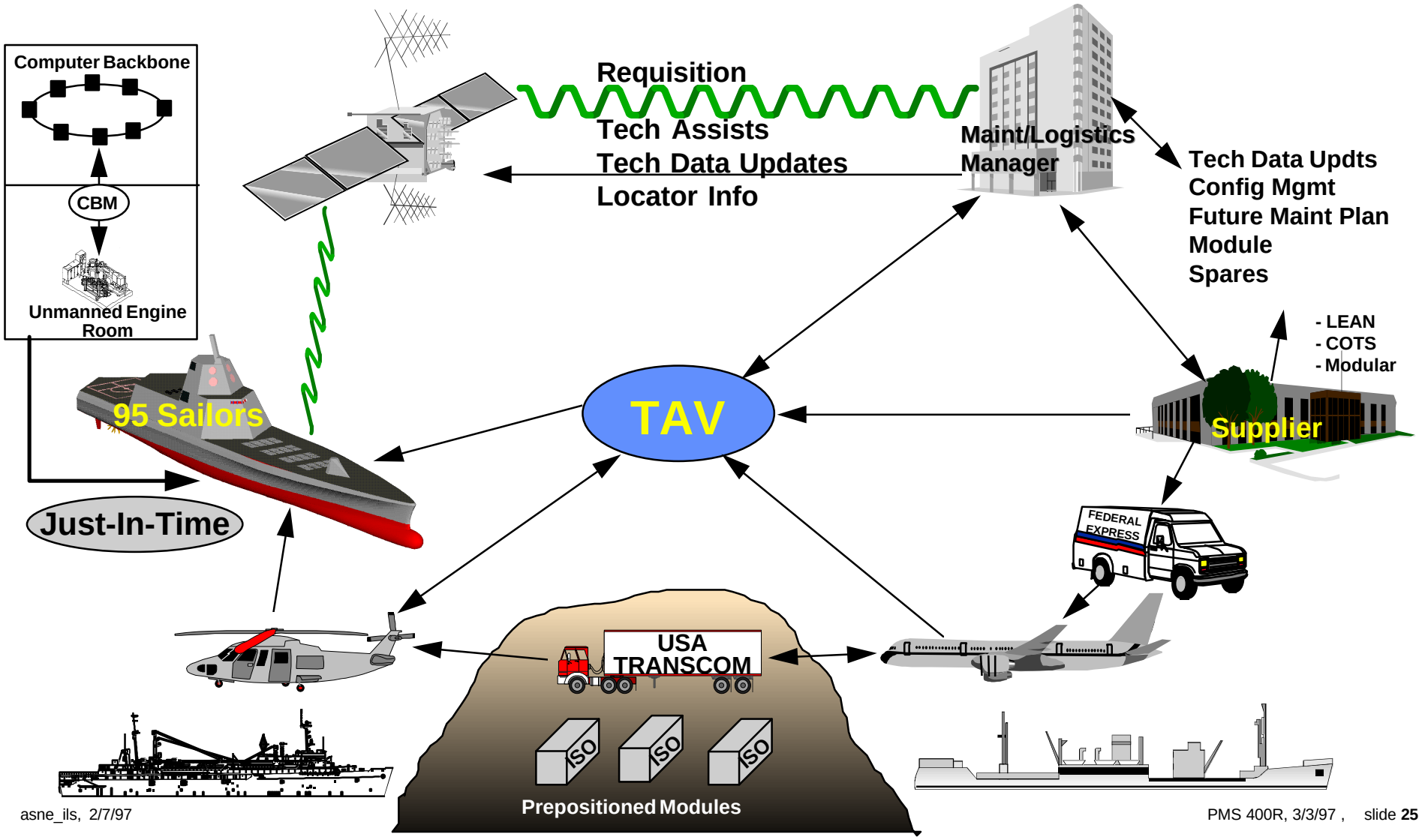
- **Total Integrated Digital Environment**
  - **Technical-Supply Support-Administrative**
- **Multi-Echelon Readiness Based Sparing**
  - **Shipboard and Ashore**
  - **Training**
  - **Spares**
  - **Technical Data**
- **Just in Time**
- **Joint Total Asset Visibility**
- **Single Agent for Logistics/Maintenance Management**
- **Team with Industry for Best Practices**

THE THREE YEAR DEPLOYMENT

- High Reliability . . . . 3 Years between Depot Availability
- Rotating Crews
  - Blue/Gold/Green (?) +
  - Maintenance/ Caretaker Crew
- Crews Must Arrive Ready to Fight
  - Just-In-Time Training
  - Virtual Mission Training between Deployed / Non-Deployed Crews
  - Virtual Turnovers
  - LBTS/LBES used for Training and Deployed Ship Monitoring
  - Crew Trains Together/ Fights Together
- Consider the Following . . . . . .
  - Air Crew Model (One Crew / One Ship not Sacrosanct)
  - Platform (Operators / Support Systems) / Payload (mission specialist) Crews
  - Personnel Leave / Report only in Non-Deployed Crew

Major Paradigm Shift Required

Improved Logistics Response Time .... Maximum Asset Availability

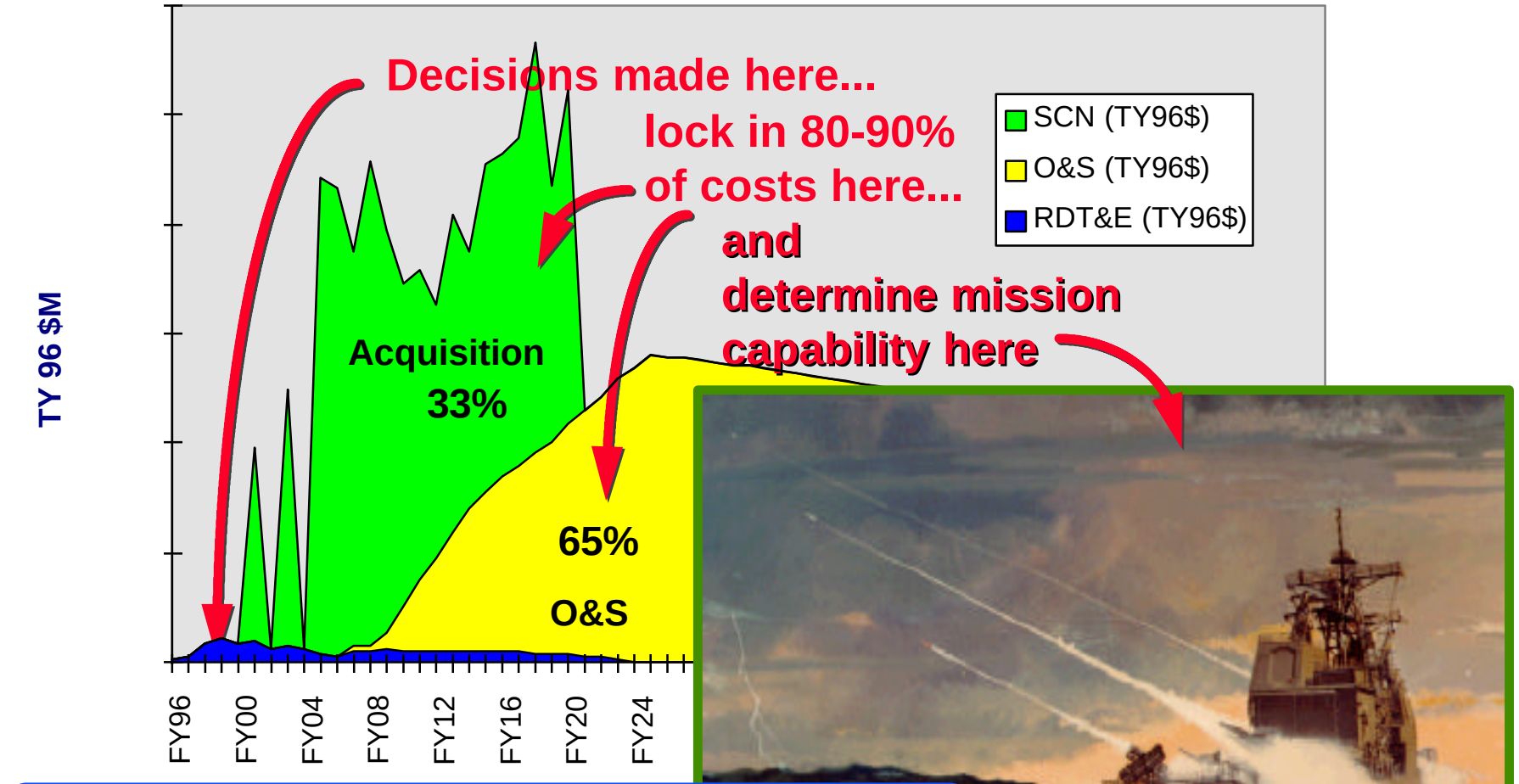


SUMMARY

- SC-21 Logistics Approach Developing
- Consistent with Joint Vision 2010
- Logistics Integrated to the TSE Approach
- High System Reliability Essential
- Information Systems .... Key
- Government / Industry Partnership Necessary for Success

New Way of Doing Business !

RE-ENGINEERING THE NAVY



INVEST NOW FOR THE FUTURE

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